July 29, 1959

Dr. Thomas Francis, Jr.
University of Michigan
School of Public Health
Ann Arbor, Michigan

Dear Dr. Francis:

Dr. Hartline recently mentioned how you shared our common interest in planetary microbiology and that you had accepted his invitation to join Committee Eleven of the Space Science Board. I think this is a splendid development and I am really just beginning to feel quite optimistic that this aspect of space research is following an orderly and constructive orientation.

As you may know there have been two informal subcommittees devoting themselves to some aspects of extraterrestrial biology. They have centered respectively at Boston and San Francisco so we call them jocularly, Eastex and Westex. I am enclosing some materials from Westex meetings that may be of interest to you. We do not have a proper summary of the second and third meetings. We are using these discussions as the basis of a draft "position paper" to be presented to the Space Science Board at its meeting in October. We are planning another meeting of Westex in September to review the draft paper. I would be pleased if you found it possible to attend this Westex meeting; we have not yet set a definite date, but it will probably be sometime after the 18th of September, which is the date for the dedication of the new Stanford Medical Center. We have a budget for travel expenses from the Board which could cover your round trip costs. If you can think of coming, would you let me know if there are any dates in September that would be especially convenient or inconvenient for you.

Since a return planetary mission still seems somewhat remote, we have not yet given very earnest consideration to a further problem in planetary microbiology that might ultimately prove to be of utmost importance. This is, whether there is any possibility of back contamination: If Mars or Venus proves to be a locus of some sort of life, can we visualize any circumstances in which the uncontrolled importation of it might be deleterious to our own ecology. Of course I should think it quite unlikely that we need be too concerned about a zodiacal epidemic but I think some thought might be given to the question whether more subtle ecological disturbances are conceivable. What sorts of nuisances could one think of as a consequence of importation of wholly new forms of microorganisms, or for that matter macroorganisms? What makes thinking in this area so difficult is that we have to draw our inferences by multiplying very low probabilities by very large consequences. Can you think of some way, for example, of making a quantitative statement (however inexact) of the

likelihood of a back contamination dangerous for man. If this estimate should be as high as 10^{-6}, this remote possibility of a hazard might prove to be a controlling consideration in mission plans. Would it be asking too much for you to give some preliminary thought to this question so that the matter can be broached in the position paper? Even better, if you have time to prepare a minute somewhat sooner, we could put it on the agenda for the Westex meeting whether you are able to come in person or not.

We know so little that we must, of course, proceed from multiple hypotheses examining the possible consequences of each one. If there are planetary biota whose fundamental organization resembles our own, we might be able to rely on general considerations of specificity of adaptation and generalized defense mechanisms in disposing of them. If they are quite unlike our own, I think the situation may be more problematical. On the one hand, the odds would be all very much against a good adaptation for pathogenic habit; but by the same odds, our own generalized defense mechanisms and possible even particular ones like immunity, might have nothing with which to react. Meager as the facts are, I think the problem does warrant very serious consideration in a systematic way and I hope that this is one of the items that comes within the purview of your expressed interest in Space Science. While the question may remain academic for an indefinite period to come, we have also learned how long it takes to mobilize effective action on an international scale so I do not believe that it would be premature to begin thinking about this problem right now.

I am enclosing some material that may be of interest to you.

Yours sincerely,

Joshua Lederberg
Professor of Genetics

Encl.